

Studies in Agricultural
Capital and Technology

Economics and Sociology
Occasional Paper No. 53

Growing Labour-force and Unemployment

by

S.S. Johl
Visiting Professor

December, 1971

Department of Agricultural Economics and Rural Sociology
The Ohio State University
2120 Fyffe Road
Columbus, Ohio 43210

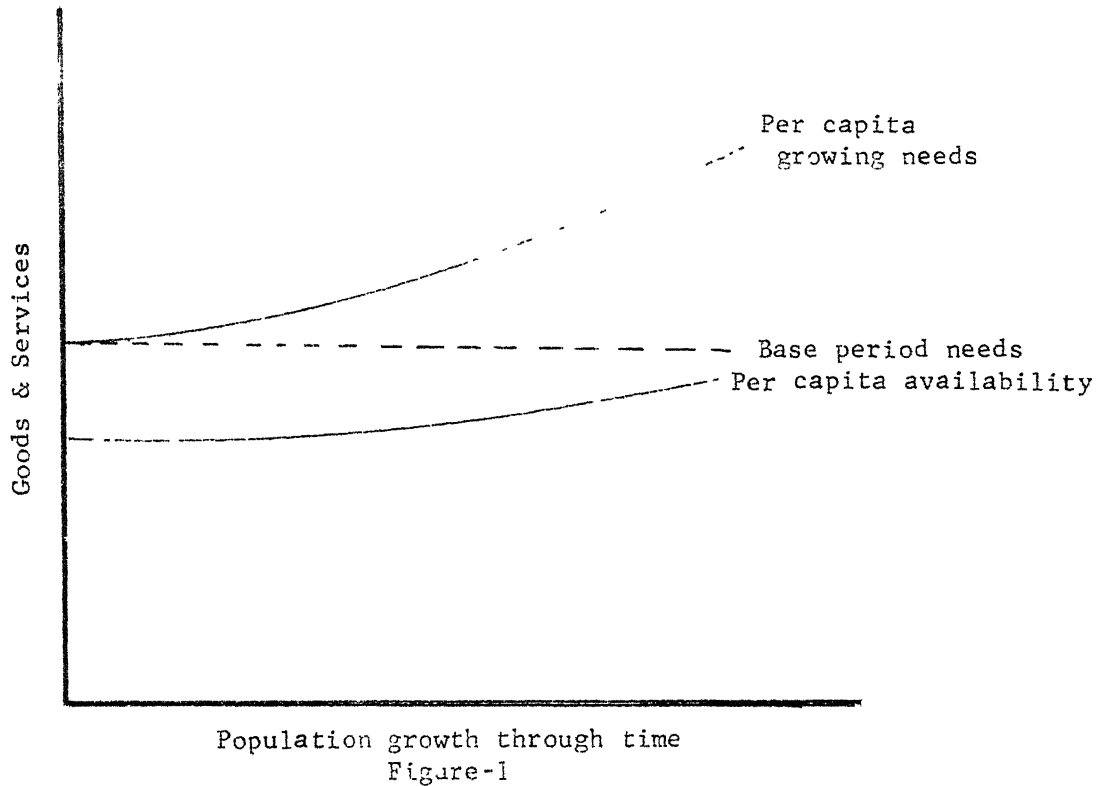
Growing Labour-force and Unemployment

Basically the development problem of the countries of the so called third world' is their failure to provide adequate food, clothings and shelter for their fast growing populations. It has been more or less a losing battle of efforts on production of goods and services against the fecundity of human beings. Whereas on one hand, these underdeveloped nations of Asia, Africa, and Latin America are finding it difficult to provide for basic necessities of life to their people; on the other hand, rising expectations of the masses through demonstratior effects of contacts with the larger developed world and unfulfilled promises of the local leaders and political parties are contributing a great deal to the widening of the gap between the availability of goods and services and the needs of the fast growing numbers.

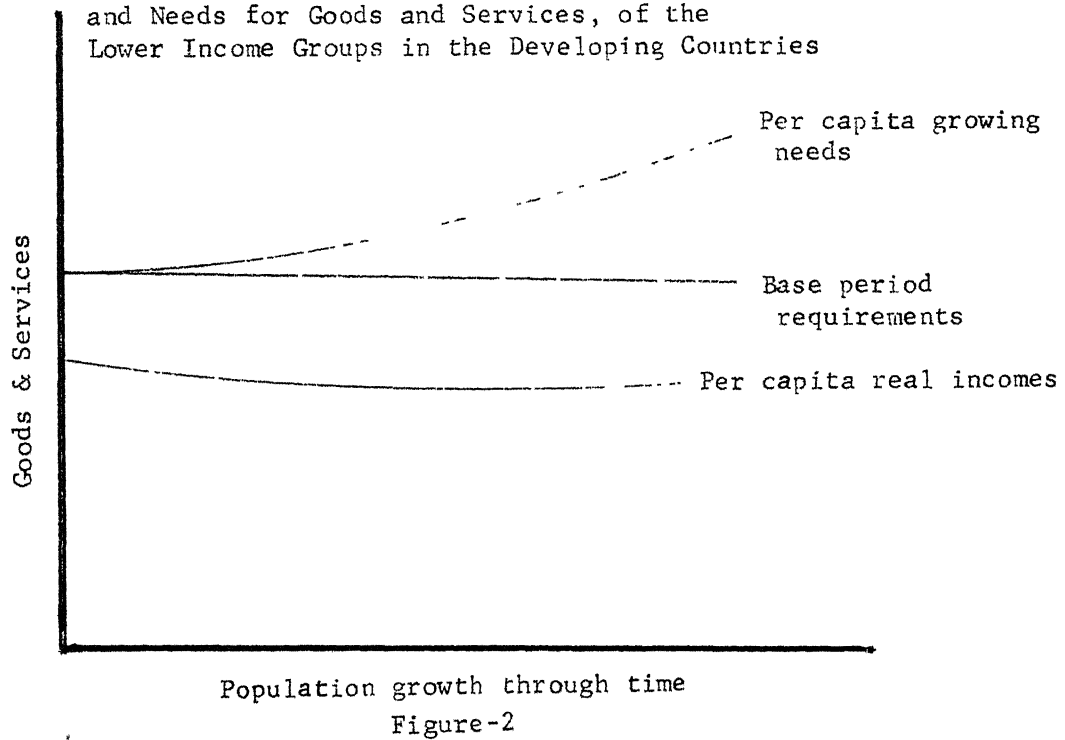
The gap between per capita availability of goods and services and per capita needs for them is, thus, widening as illustrated in the diagram-1. More disquieting is the fact that this gap is becoming still wider for the large majority of people who are poor and have incomes below national averages, due to acute disparities in the income distribution. For the lower two-thirds of the populations in these countries the gap has been widening due to rising expectations and static (sometimes decreasing) per capita real incomes as illustrated in diagram 2. Thus, the problem is two-fold: (1) growing gap between the per capita availability of and needs*

*Term 'needs' instead of 'demand' is used here because demand is an economic variable, and need is a physical and psychological requirement irrespective of the level of prices and income.

Growing Per Capita Gap in Availability of and Needs
for Goods and Services in the Developing Countries



Growing Per Capita Gap in Availability of
and Needs for Goods and Services, of the
Lower Income Groups in the Developing Countries



for goods and services and (2) the gap growing wider for the majority of the people, due to their being left out of the main stream of benefits of the national growth. In India, for example, per capita national income in real terms increased by less than Rs. 15.00 (\$2.00) only from 1960-61 to 1967-68 [6]. With all the indications of growing concentration of wealth in fewer hands and widening disparities, the poorer sections of the society (a large majority) is suffering from increasing deprivations. Very similar picture is presented by other economies of Latin America, Africa and Asia. Gini's ratios worked out by Oshima for deciles of populations with respect to inequalities of income distribution for South Korea, Philippines, Thailand, Malaya and Ceylon in comparison with USA, Japan and Taiwan clearly demonstrate acute disparities in income distribution in the less developed countries. [7] In the background of these disparities, slow growth of real per capita incomes in these countries makes the lot of the large majority of the population worse off. An indication of these deprivations is provided by the low nutritional levels of the low income classes. Table-1 shows a wide divergence of calories and protein intake between different income classes in some countries of Latin America, Asia and Africa. [14]

Because of low per capita incomes and availability of goods and services in these economies, their development effort has been mainly concentrated on increasing the total national product. Big push forward, critical minimum effort, high potential area and enterprise concentrations and other such efforts and approaches in these countries had been based on the philosophy of increasing the total size of the pie without much of a concern as to where it is generated and how it gets distributed. Balanced and unbalanced dualistic and single sector growth models all focused on rate of total growth. Main thrust in 1950's and 1960's, thus, remained on increasing the total production (especially food production) in order to feed the large and

Table-1

Nutrition levels by income class in some
selected countries of Latin America, Africa and Asia

Family Income/ Expenditure Group	Percentages of families	Calorie intake	Protein intake	
		kCals (per capita)	Grams (per capita)	
<u>Latin America</u>				
Brazil (1960-61)				
Annual family income (new cruzeiros per year)				
<u>Urban areas</u>			Total	Animal
under 100	4.16	1,315	35.6	(10.5)
100 - 249	21.64	1,738	49.1	(15.1)
250 - 499	31.48	2,227	66.9	(25.6)
500 - 1199	30.54	2,830	95.7	(40.1)
1200 and over	11.80	3,569	119.9	(65.1)
total average		2,345	73.2	(27.2)
<u>Rural Areas</u>				
under 100	7.94	1,755	50.0	(13.2)
100 - 249	27.36	2,267	64.9	(21.7)
250 - 499	29.56	2,577	75.9	
500 - 1199	24.56	3,144	95.4	(39.1)
1200 and over	10.52	3,674	116.6	(52.5)
total average		2,083	80.6	(31.0)
Colombia (1956-62)				
'very poor' rural		1,535	36	(9)
'very poor' urban		1,538	34	(15)
'middle class' rural		2,136	52	(22)
'middle class' urban		2,183	60	(31)
Mexico (1958-59)				
'very poor' rural		1,788	45	
'very poor' urban		1,803	51	
'middle class' rural		2,275	57	
'middle class' urban		2,331	64	
Peru (1951-53)				
mountain area		1,754	47	
coastal area		2,205	64	
<u>Asia</u>				
Ceylon				
rural (1961-66)		1,864	44	(6.3)
upper class Colombo (1957)		3,271	84	

Table-1 cont'd.

Family Income/ Expenditure Group	Percentages of families	Calorie intake	Protein intake	
		kCal. (per capita)	Grams (per capita)	
			Total	Animal
Iran				
Landowners		2,658	74	
Urban wage earners		2,132	65	
Peasants		1,842	60	
India, (1958)				
Maharashtra State				
expenditure per capita				
(rupees)				
Urban and rural areas				
0 - 11	21.3	1,340	37.9	(1.4)
11 - 18	18.9	2,020	56.6	(2.6)
18 - 34	20.7	2,485	69.0	(6.6)
34 and over	39.1	3,340	85.7	(11.9)
total average		2,100	59.7	(4.5)
<u>Africa</u>				
Madagascar 1962				
Income in 1000 fr. per				
family/year				
1 - 20	54.7		47.3	(5.5)
20 - 80	38.3		53.9	(9.0)
80 - 190	5.3		60.2	(15.2)
190 - 590	1.2		65.0	(22.5)
U.A.R. (1965)				
Low income class		2,204	71	(15.0)
Middle income class		2,818	84	(18.0)
Higher income class		3,130	98	(37.0)
Tunisia 1965-67				
dinars per person				
Rural areas				
less than 20	8.2	1,782		
20 - 32	16.2	2,157		
32 - 53	30.3	2,525		
53 - 102	32.4	2,825		
102 - 200	10.9	3,215		
200 and over	1.5	3,150		
total average		2,609		

Sources: Turnham [14]

rapidly growing populations. A slower growth of opportunities of employment largely due to concentrated area, sector and enterprise efforts, however, left main stream of the population untouched. Unemployment in the late 1960's, thus, grew unprecedentedly. Thorbecke estimated that unemployment in Latin America grew from 5.6 percent in 1950 to 11.10 percent in 1965. The unemployment equivalent (percent of unused labour hours to total available labour hours) worked out to be between 20 to over 50 percent [13,14,16]. Eicher, et.al., showed that non-agricultural employment opportunities during the period 1950 through 1964 actually decreased at a rate of 1 percent in Cameroon, 0.5 percent in Kenya, 0.7 percent in Malawi, 0.4 percent in Tanzania, 0.1 percent in Uganda and 0.9 percent in Zambia [2]*. Of the African countries, only in Ghana the employment increased appreciably at a rate of 6.3 percent during this period. Sierra Leone had 3.0 percent employment growth rate; Neregria, 1 percent; and Southern Rhodesia only 0.2 percent.[2] They state, "rising unemployment in Africa is a major social, political and economic problem. A convergence of forces, including the population explosion, has led to rising rates of unemployment which are expected to increase in the 1970's".

The prospects of employment in the seventies do not seem to be very encouraging. Estimates of Tobias for instance, indicate that in India alone labour force will increase from 210 million in 1970 to 273 million by the end of the seventies and, thus, labour force will be increasing at an increasing rate[15]. Eicher, et.al., estimate that in 1985 the number

*Source of figures used by Eicher, et.al., is Frank, Charles R. Jr., Urban Unemployment and Economic Growth in Africa, Center Paper No. 120, New Haven, Connecticut, Economic Growth Centre, Yale University, 1968.

of working-age males in Tropical Africa will increase by 56 per cent over a 57,421 thousand figure of 1965 [2]. Turnham's estimates of growth of labour force for various countries and regions of the world, as reproduced in Table -2, show that the decade of seventies is going to witness an increasing rate of growth in labour force in all the developing regions of the world as compared to fifties and sixties [14]. Lester Brown has, thus, rightly observed, "the food-population problem of the sixties is becoming the employment-population problem of the seventies" [1].

Of particular interest to us today are, thus, the consequences of what happened in the decade of sixties. The experience of this decade can be described as: (1) a considerable growth in population and labour force, (2) incognizant or no improvement in the standards of living for a bulk of the populations, (3) incomes in traditional sectors (agriculture and menial services) experiencing not very significant improvements, (4) modern sector incomes increasing at a faster rate, (5) rural to urban migration pressures increasing at higher and higher rate and (6) fiscal and other policies proving not very effective in reducing regional and personal disparities in incomes. This created a self-aggravating system of links and back-loops between state policies, labour force growth, unemployment and wages and income disparities. With the population increasing at a high rate, employment opportunities in the traditional sector (agriculture) not matching up with the demand for jobs and a deliberate emphasis on developing modern sector (industry) lead to wide disparities in the traditional and modern sector incomes. Rural to urban migration of workers increased which lead to widespread unemployment and under-employment in the urban areas and swelled up the ranks in the traditional service sector [14,16]. With the population pressures remaining still very high in the rural areas, under-employment and disguised unemployment increased. A situation of rising

Table-2

Estimates of growth of the labour force
in less developed countries: 1950-1980

percentage rates

	Rates of growth			
	1950-1965		1970-1980	
	Total	Annual	Total	Annual
Developed countries	17.6	1.1	10.0	1.0
Less developed countries	28.1	1.7	25.2	2.3

<u>Regions</u>				
Other East Asia	30.7	1.8	35.3	3.1
Middle South Asia (1)	23.2	1.4	21.6	2.0
South East Asia (2)	32.3	1.9	28.0	2.5
South West Asia (3)	31.8	1.9	31.3	2.8
West Africa	38.9	2.2	25.8	2.3
East Africa	21.1	1.3	19.8	1.8
Central Africa	16.0	1.0	12.9	1.2
North Africa	17.5	1.1	29.0	2.6
Tropical South America	48.3	2.7	34.7	3.0
Central America	52.0	2.8	39.1	3.4
Temperate South America	25.7	1.5	16.0	1.5
Caribbean	31.1	1.8	25.8	2.3

Source: Turnham[14]

Note: Excludes Sino-Soviet countries.

(1) Includes Ceylon, India, Iran and Pakistan.

(2) Includes Burma, Cambodia, Indonesia, Malaysia, the Philippines and Thailand.

(3) Middle East countries.

wages in the modern sector due to various promotional and protective policies, increasing labour surpluses and widening regional, sectoral and personal income disparities developed in these economies.* Rising wages, growing concentration of economic and political powers and explicit emphasis on modernization lead to public policies of capital subsidization in the industrial sector. The economic and social environment for a large majority of the people (low incomes and slums, etc.) became conducive to high population growth rate. The policy emphasis on investments in capital intensive technology, increasing wages due to labour-union pressures and government policies, and high birth rates of sixties are now projecting into the seventies in the shape of fast increasing labour force and higher unemployment rates.

Nature of Employment in Agriculture

Agriculture being a major sector in most of the developing countries has to play a pivotal role in providing employment to the increasing labour force in the rural areas. It is, therefore, essential first to understand the nature of employment in this sector. Traditionally this sector has been providing employment to the rural labour force at an 'institutional wage' paid in kind at the time of harvest(s).** The employment being seasonal with acute work load peaks and slacks for a major part of the year, labour was simply sticking around to get employed and often over-worked during the sowing and harvest periods of crops. With the traditional technology of sickles and spades, there was not much of a prevalence of structural (year round) unemployment. More so it was a case of seasonal unemployment

*This aspect is more thoroughly analysed elsewhere, See Johl [9] .

**Institutional wage is equal to total product divided by total labour force, as defined in the dualistic models of growth.

and under employment as shown in the diagram 3.

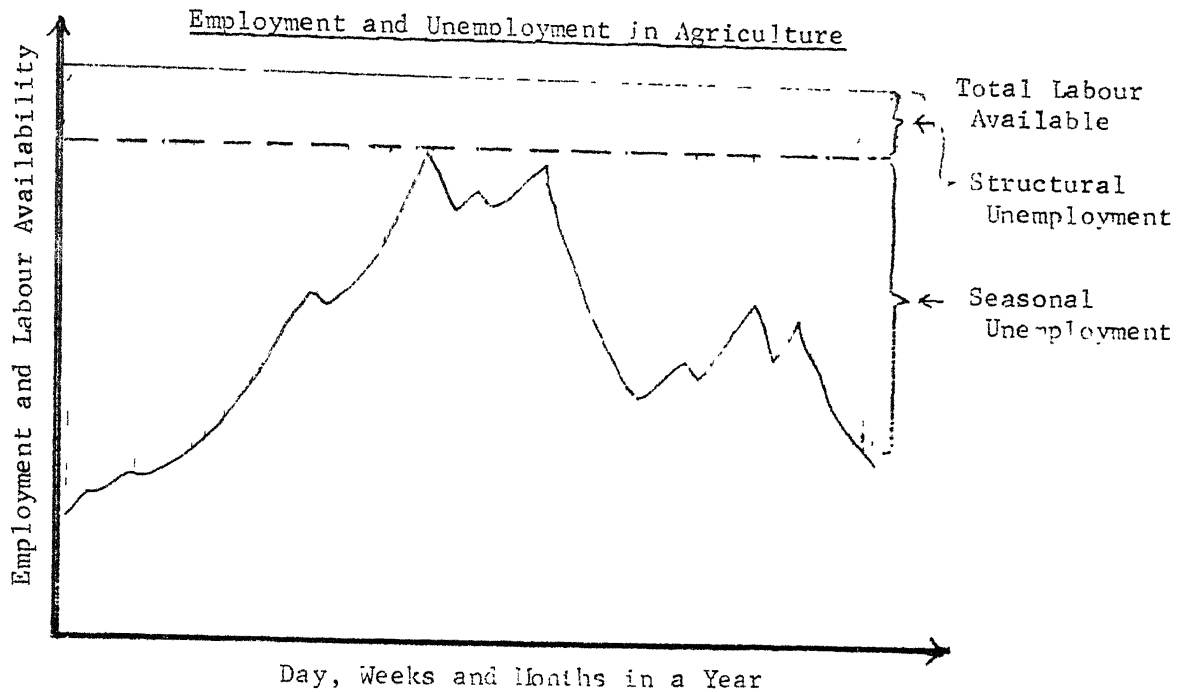


Figure-3

Since in peak-work periods of production and marketing, agriculture suffered from acute shortages of labour, it kept lots of otherwise surplus labour sticking around for the rest of the year especially when gainful employment was not easily available outside of agriculture. This explains the non-zero marginal productivity of labour in agriculture in the midst of unemployment and under-employment.

As these economies began with the process of modernization, agriculture also got influenced, of course not in a very big way. To the extent the non-conventional investments in agriculture came in the form of machines and improved equipment to relieve labour shortages at peak-work load periods, the process started reducing the peaks of employment and more of the seasonal unemployment got converted into structural unemployment.

To the extent only peak-period labour shortages were relieved, it encouraged intensity of cropping and operations, creating more jobs during the rest of the year. To the extent these machines and equipment took

over the slack season work, it aggravated the problem of unemployment and under-employment. What happened to the total employment and jobs for labour is a question of what were the initial conditions and the types and levels of machine-use.* More obviously, however, considerable amount of seasonal unemployment got converted into structural unemployment.

Migration to Traditional Service Sector

With the non-agricultural sector employment not growing enough to siphon off these labour surpluses being generated both due to the increasing population and introduction of labour-saving devices, it created conditions of unrest in many parts of the world and increased also the flows of rural-urban migrations in expectations of finding some gainful employment in the urban areas. This added to the urban unemployed and to the numbers in the urban-traditional-services sector. The traditional services sector, thus, started playing increasingly the role of absorbing excess labour in urban areas, as the agricultural sector was doing in the rural areas [2,13, 14,16]. A great bulk of labour in less developed countries, thus, remained under-employed or disguisedly unemployed in the low productivity traditional sectors. Table-3 provides a picture of changes in the structure of employment between the period 1950 through 1960 for less developed countries of Latin America, South and East Asia and North Africa. A more clear case of such a structural change in employment is provided by Latin America as shown in Table-4. Whereas the share of employment in the primary sector (agriculture, mining) and artisan industry declined, major increases came in the unspecified (services) sector which is believed to be consisting of low productivity, traditional or menial services. The employment structure

*For a detailed discussion of this aspect, see Johl [10].

Table-3Changes in the structure of employment: 1950-1960

		Agriculture	Mining, manufacturing and utilities	Construction	Commerce and Transport	Services
All less developed						
	1950	73.3	8.2	1.8	7.6	8.9
	1960	70.7	9.7	2.0	8.0	9.6
Latin America						
	1950	54.1	15.0	3.6	11.7	15.6
	1960	50.1	15.6	4.4	14.1	15.9
Asia, South and East(1)						
	1950	75.3	7.7	1.1	5.9	8.8
	1960	73.1	9.2	1.3	7.2	9.4
North Africa(2)						
	1950	72.9	7.3	1.9	9.1	8.1
	1960	59.6	3.1	2.2	7.7	11.4

Source: Tables calculated by Bairoch and Limbor, reproduced from Turnham [14].

(1) Excludes Middle East countries.

(2) Algeria, Morocco, Libya, Sudan, Tunisia and the U.A.R.

Table-4

Changes in the structure of employment in
Latin America, 1950-1969

	Structure of employment			Growth rates	
	1950	1960	1969	1950-1960	1960-1969
Agriculture	53.4	47.2	42.2	-1.3	-1.5
Mining	1.1	1.0	1.0	-2.0	-2.2
Manufacturing	14.4	14.4	13.8	2.0	-2.3
of which:					
Factory industry	6.9	7.5	7.7	3.7	2.9
Artisan industry	7.5	6.8	6.1	-1.5	-1.6
Construction	3.3	4.1	4.5	2.2	4.0
Transport and public utilities	4.2	5.1	5.5	4.6	3.4
Commerce and finance	7.3	9.1	10.1	4.1	4.1
Miscellaneous services	13.0	15.6	17.3	4.5	4.0
Unspecified (services)	2.3	3.6	5.6	7.3	8.2

Source: Turnham [14]

and changes in it during the period 1961-69 in India also point towards the same direction, as shown in Table-5. Here, too, services sector employment increased more conspicuously compared to any other sector. Of the 4.54 million increase in total employment during 1961 through 1969, 2.25 million (about 50%) occurred in the services sector.

Some Outstanding Characteristics of Unemployment

The unemployment situation in the developing countries has some outstanding features. An important aspect of it is that the actual unemployment is much higher than the official statistics reveal. In Latin America, for example, unemployment estimates in 1960 were made at 9.10 percent of the labour force, but the actual unemployment equivalent worked out to be 25.7 percent [13]. As Turnham puts it, "A priori reasoning perhaps suggests that in terms of the measurement procedures commonly adopted in less developed countries, the 'bias' is likely to be towards understatement of unemployment". [14] Since agriculture absorbs a major portion of the working population ranging from 45 to 80 percent in different countries and also that agriculture is a self-employment sector, a large part of the underutilized labour force remains to be in agriculture. In Latin America, for example, 59.5 percent of the total unemployment was accounted for in the agricultural sector [13]. Again, 30 to over 50 percent of the labour force in agriculture is under and unemployed. However, on the contrary, the census and survey data reported in official estimates show almost all the unemployment concentrated in the urban areas.

Another important feature is that unemployment rates are higher in younger age groups, especially 15-24 years. This age group being more mobile, the unemployed persons in this group are increasingly migrating to the urban centres. During the last two decades, the increase in the urban population has been over three times the increase in the rural population.

Table-5

Industry-wise Employment during 1961-69

India

(million)

sl. no.	industry	employment in march					
		1961 ^{2/}	1966 ^{2/}	1966 ^{3/}	1967 ^{3/}	1968 ^{3/}	1969 ^{3/}
(0)	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	plantations, livestock, forestry, fishing, etc.	0.85 ^{1/}	1.10	1.13	1.10	1.10	1.07
2	mining and quarrying	0.68	0.66	0.67	0.65	0.61	0.60
3	manufacturing	3.39	4.26	4.53	4.45	4.44	4.53
4	construction	0.84	0.99	1.02	0.99	0.90	0.94
5	electricity, gas, water and sanitary services	0.26	0.35	0.34	0.38	0.39	0.41
6	trade and commerce	0.25	0.39	0.49	0.51	0.53	0.55
7	transport and storage and communications	1.81	2.21	2.21	2.24	2.24	2.27
8	services	4.01	5.50	5.80	6.00	6.12	6.26
9	total	12.09	15.46	16.19	16.32	16.33	16.63

^{1/}Incomplete coverage.^{2/}Covers all public sector establishments and non-agricultural establishments in the private sector employing 25 or more workers.^{3/}Covers all public sector establishments and non-agricultural establishments in the private sector employing 10 or more workers.

Source: [6]

This migration is taking place mainly due to push effects from the rural traditional sector because of the lack of gainful employment opportunities available there. The traditional rural (agriculture) and traditional urban-services sectors have been, thus, claimants of the residual labour-force which could not be absorbed in the modern sector.

Income Disparities

As a mirror image of the nature of unemployment and employment in the traditional and modern sectors of the developing economies, disparities in incomes and wages are increasing. In India, for example, net national income originating from agriculture (mainly rural incomes) vis-a-vis total non-agricultural incomes (mainly urban incomes) increased in the ratio of 1.17:1.0 during the period 1961-66. After accounting for 60:20 distribution of population in rural and urban areas, however, the ratio reversed as 1.0:3.4*. In the case of dual economies, as most of the developing countries are, the two sectors (agriculture and industry) are generally located in different regions. This leads to wide disparities in regional incomes. These disparities in personal and regional incomes are leading these economies to strong social and economic polarization and even political unrests in many parts of the world. In the decade of seventies, employment creation and reduction in income disparities has to be, therefore, an explicit policy objective of the developing countries.

The Role of Price Distortions

As explained in the earlier sections, during the last two decades population and labour force increased unprecedentedly, increasing the supply of job seekers unmatched by the demand for them. The demand did not increase appreciably because of very slow technological improvements

*Calculated from national income figures reported by industrial origin [6].

in the major sector (agriculture) and there being no scope of further reducing the already rock-bottom subsistence wages to absorb additional supplies of labour. An emphasis on the introduction of modern technology, on the other hand, lead to the policies of distorting the factor prices whereby capital was priced below its market price. The price distortions such as imports of capital at an over-valued local currency exchange rate, capital subsidies and rebates, protections and industrial promotional activities, resulted in larger investments in more capital intensive technologies in the modern sector. Factor-price distortions were further aggravated because of the inflexibility of wages to adjust downwards to the demand and supply conditions. This happened because of (1) minimum wages legislations, (2) labour unions actions, (3) social welfare considerations, and (4) wages being already very low at subsistence levels. The situation worked against the traditional sector (agriculture) and in favour of the modern (industrial) sector. Within the industrial sector, it worked in favour of capital intensive technology, leading to a slow growth of employment as illustrated in the diagram 4.

Effects of Capital-Intensive Technology and Factor Price Distortions on Employment and Capital Use

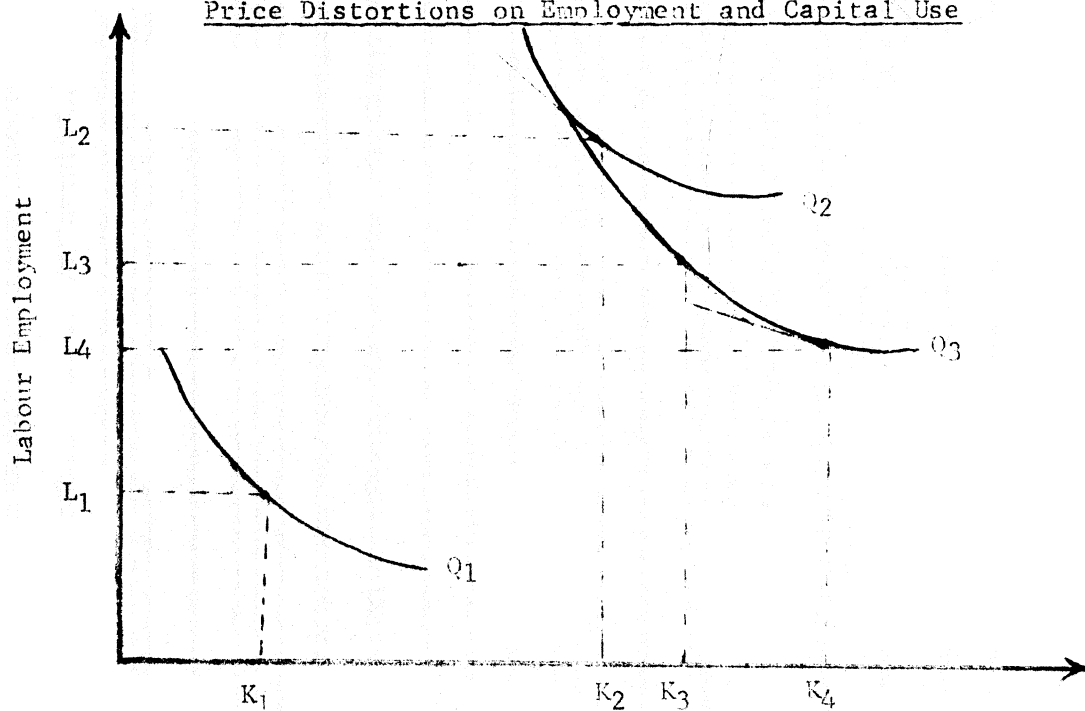
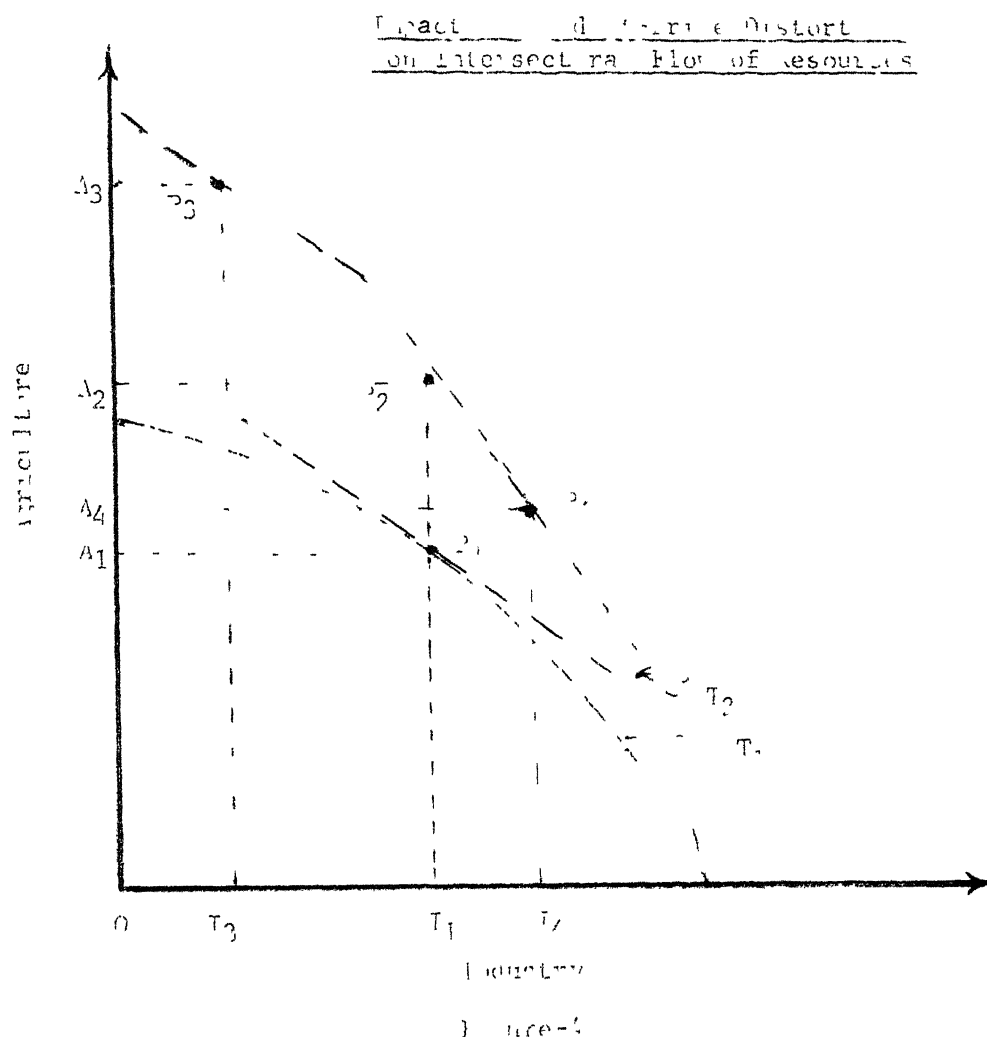


Figure-4

The curve Q_1 represents the traditional transformation curve for capital and labour. Through a period of two decades or so this transformation curve should have shifted upwards to the left at a higher level of production somewhere represented by Q_2 . Had there been no shift in relative prices of labour and capital, use of capital could have increased to K_2 with labour employment increasing to L_2 . But modernization efforts shifted this transformation curve in the direction of Q_3 due to the importation and adoption of capital intensive technology increasing the capital use to the direction of K_3 and reducing employment to the level L_3 . Price distortions further encouraged the use of capital in the direction of K_4 and reduced the labour employment to the level L_4 . Thus, through time although production of goods and services increased and employment also increased from L_1 to L_4 , yet capital use increased much more proportionally from K_1 to K_4 . With an emphasis on less capital intensive or more labour-intensive technology and without introducing factor-price distortions through explicit policy actions the labour employment could have increased to L_2 instead of L_4 and capital use could have remained low at K_2 instead of K_4 .

The product price distortions on the other hand did not permit inter-sectoral flow of capital to the extent it should have flowed from the agricultural to the industrial sector. With an emphasis on modernization in the early phases, agricultural shortages, especially of food, started bothering the food deficit economies. In the absence of very discernable technological improvements in agriculture, price incentives were given to the farmers in the form of higher and higher support and government procurement prices in order to boost up production. This was a consistent policy at the then existing level of production technology, to achieve higher production and it fit in well with the requirements of first stage

of development to encourage agricultural production and surpluses. In late sixties, however, agricultural production, especially of wheat and corn, increased considerably mainly due to the seed fertilizer revolution irrespective of price incentives. Yet, price policies remained supportive of agricultural prices at the same higher levels and did not thereby encourage the flow of capital to the industrial sector as illustrated in diagram 4, representing Indian situation.



T_2 curve represents a neutral change in agricultural production technology from the initial transformation curve T_1 as it occurred in late sixties. Production and allocation of resources on T_1 was OI_1 in industry and OA_1 in agriculture with relative prices line being tangent at P_1 . Immediate

impact of improvement in agricultural production technology has been to shift the agricultural production up to OA_2 , industrial production remaining OI_1 . With the relative price ratio held constant, agricultural production shifted up to OA_3 through partial diversion of resources from the industrial sector reducing the industrial production from OI_1 to OI_2 . With the increased agricultural output, however, agricultural prices should have fallen reducing the use of resources in agriculture and its production to a level representing a combination of OA_4 agricultural output and OI_4 industrial production. As a result of improvements in the agricultural production technology, the production resources must have, thus, flowed to the industrial sector. But these healthy influences were held up by the high agricultural support prices, generating more and more of agricultural surplus with higher and higher burdens of support prices on public funds. This is what has been happening in many of the developing countries in the second half of the sixties. The benefits of increased productivity have not been flowing out to the industrial sector in the form of cheaper wage goods and capital transfers. As a result, lesser number of jobs have been created in the capital starved modern sector.

The factor and product price distortions have, thus, created conditions where resource allocations have gone inconsistent with the resource endowments of the developing nation. A little better respect for the role of natural market forces in bringing about resource use adjustments could bring the resource allocations close to the resource endowments optimizing the use of scarce capital resources and increasing the level of employment.

Some Policy Implications

The foremost policy objective of the developing countries in the seventies, as stated earlier, should be to create more job opportunities and reduce the level of disparities in regional as well as personal incomes.

The former is a necessary step to cope with the increasing flow of the new labour force generated by high birth rates of fifties and sixties. The latter is a must to avoid serious socio-economic polarization and political unrests. Some specific measures to achieve these over-riding objectives can be listed as under:

(1) Removing the factor and product price distortions is an essential first step for these economies. Unless these distortions are removed, production technology will remain unduly capital intensive, unemployment will persist, inflationary pressures will continue and the economy will operate at a below optimum level, resource use remaining at variance with the resource endowments. Several measures or their combinations can remove or reduce these distortions. First of all, market prices of products should be allowed to adjust to the demand and supply conditions. Product price policies in agriculture should be more concerned with disciplining the seasonal and irregular price fluctuations rather than with maintaining the annual or secular prices above the levels justified by the supply and demand forces, as is generally the case at present in most of the LDC's. If the public authority has got to administer prices, price determination should remain consistent with the changing demand and supply conditions and should account for technological improvements in the production processes.* The factor-price distortions can be corrected if the modern sector entrepreneurs are made to use capital and employ labour at their real market price, which means no undue capital subsidization, internal allocation of foreign exchange at the open market rate (shadow price) rather than official exchange rate and no undue prolongation of the protection of industry on grounds of size of business or its being infant. Modern sector must, in

*A systematic procedure of price determination under government administered price structure is discussed elsewhere. See Jh1 [11].

short, be provided with opportunities to develop on a challenge of market competition at real factor and product prices.

(2) More emphasis needs to be laid on adaptive research to develop indigenous technology which will suit the resource endowment of the economy. Evonson estimated that in 1960 total research expenditures in Africa, Central and South America and in Asia excluding Japan and Israel amounted to only 10 percent of the world expenditure on research. Asian and Latin American countries spent barely more than 0.10 percent of Agricultural GDP contrasted with 2.17 by USA, 2.98 percent by Australia, 2.67 percent by Israel, 1.62 percent by Canada, 1.24 percent Japan, and .88 percent in Western Europe [4]. Many programs designed to introduce non-conventional inputs and modern technology borrowed from the developed countries have not thus been very successful because the imported technology was not fully consistent with the resource endowments of these countries. When such programs apparently seemed to be successful, they generally created unemployment or at least did not generate sufficient additional employment opportunities. What is badly needed at this stage is not a mere modernization of the traditional sector or industrialization, but more so, development of indigenous technology that generates more and better jobs along with increasing production in the agricultural sector. Hence, an explicit emphasis on adaptive research.

(3) The vital element to link technological development and its adoption in the economic environment generated by the factor and product prices structure is the human skill. Due to a lack of appropriately skilled and technically trained workers for some pivotal jobs, level of technological adoption and general employment remains low. Job-oriented training or vocational education must go hand-in-hand with the development of indigenous technology. In spite of general and liberal education having its own long

run broad ranged advantages, job-oriented and specific professional education must get precedence in the developing countries. Those going in for liberal education should take it as of their preferred choice instead of having almost the only alternative available to them, as is true for the majority of persons at present in the less developed countries. A large number of educated unemployed persons in the presence of many unfilled job vacancies is a very common phenomenon and it is mainly due to educational system not matching with and up to the needs of the economy.

Family Planning and Birth Control

Last, but not the least, an increasing emphasis needs to be laid, infact an all out effort needs to be made, on birth control and family planning. There are clear economies in reducing the birth rate. Enke, for example, estimated that an individual's life time consumption in India exceeded his production by Rs.6000/-. At ten percent discount rate, this worked out to be Rs.690/-. Considering that this money has an opportunity cost, he worked out the discounted value of a prevented birth to be Rs.1000/-. He observed, "Resources devoted to population control would be five hundred times as rewarding as resources of equivalent value invested in traditional development projects" [3] . Meier estimated a benefit of \$20.00 per year per birth prevented for a society with per capita income of \$100.00 and a benefit of \$60.00 for a society with per capita income of \$250.00 [12] . Zaidan calculated the family benefits of preventing a birth to be four times the current per capita income and social benefits twice the per capita income [16] . This author calculated the cost of raising a child to the productive age of 16 years to be over Rs.4900 and after that swelling the ranks of unemployed job seekers [8] .

The costs of not controlling the excessive births are indeed very high. As Enke has observed, in order to get the same per capita income

after 30 years as will be yielded by increased birth control, under conditions of no control either the rate of change in technological improvements would have to be 50 percent higher or rate of savings will have to be doubled in the next 15-20 years and trippled in the next 25-30 years.

While more job creation and reduction in income disparities through removing factor and price distortions, development of indigenous technology with adaptive research and vocational and professional education should be explicitly incorporated in the policy objectives of the developing countries, family planning and birth control programs should get the highest priority, if these nations have to solve the problems of an explosive rate of growth of labour-force and unemployment.

References

- [1] Brown, Lester R., "Seeds of Change", Praeger, New York, 1970.
- [2] Eicher, Carl; Thomas Zalla, James Kocher and Fred Winch, "Employment Generation in African Agriculture", Research Paper No. 9 of Institute of International Agriculture, Michigan State University, East Lansing, 1970.
- [3] Enke, Stephen, "The Gains to India From Population Control: Some Money Measures and Incentive Schemes", Review of Economics and Statistics, 42 (3), May, 1960.
- [4] Evenson, Robert, "The Green Revolution and Technology Borrowing", (mimeograph), Yale University, New Haven, 1970.
- [5] Government of India, Fourth Five Year Plan 1964-74, Government of India Press, Faridabad, 1970.
- [6] Government of India, "India (a reference annual) 1969", Publication Division, Ministry of Information and Broadcasting, New Delhi, 1970.
- [7] Oshima, Harry T., "Labor-Force Explosion and the Labor-Intensive Sector in Asian Growth", Economic Dev. and Cultural Change, April 19, 1971.
- [8] Johl, S.S., and Hardev Singh, "Some Socio-Economic Aspects of Population Control in India", Journal of Family Welfare, 1966.
- [9] Johl, S.S., "Process of Growth in a Dualistic Economy: The Interaction of Population Growth and Technological Improvements in Agriculture", Economics and Sociology Occasional Paper No. 40, Dept. of Agricultural Economics and Rural Sociology, Ohio State University, 1971.
- [10] Johl, S.S., "Mechanization, Labour-use and Productivity in Agriculture", Economics and Sociology Occasional Paper No. 23, Department of Agricultural Economics and Rural Sociology, Ohio State University, 1971.
- [11] Johl, S.S., "An Analysis of Shifting Relative Prices and Marketing Facility Investments in the Context of Technological Change in the Developing Countries", Economics and Sociology Occasional Paper No. 37, Dept. of Agricultural Economics and Rural Sociology, Ohio State University, 1971.
- [12] Meier, Richard L., "Modern Science and the Human Fertility Problem", New York, John Wiley, 1959.
- [13] Organization of American States, "The Unemployment Problem in Latin America", (Document for Conference of Ministers of Labour) Washington, D.C., 1969.

- [14] Turnham, David, "The Employment Problem in Less Developed Countries: A Review of Evidence", OECD Development Centre, Paris, 1970.
- [15] Tobias, G., "Human Resource Utilization On Development in the Seventies", The Ford Foundation, New Delhi, 1970.
- [16] Thorbecke, Erik, "Unemployment and Underemployment in the Developing World", Document of Columbia University, Conference of International Economic Development, New York, 1970.
- [17] United Nations, Statistical Yearbook, 1969.
- [18] United Nations, Statistical Yearbook, 1966.
- [19] Zaidan, George, "The Foregone Benefits and Costs of a Prevented Birth: Conceptual Problems and An Application to the UAR", Economics Department Working Paper No. 11, IBRD, January, 1968.